

## Claims

1. A method for in vitro production of bone tissue, comprising the steps of:
  - (a) applying undifferentiated mammalian cells on a substrate;
  - (b) directly contacting said cells with a culture medium for a sufficient time to  
5 produce a continuous mineralised or non-mineralised matrix having a thickness of at least 0.5  $\mu\text{m}$ ;
  - (c) removing the substrate with the matrix from the culture medium.
2. A method according to claim 1, wherein said undifferentiated mammalian cells are bone marrow cells, especially stromal cells.
- 10 3. A method according to claim 1, wherein in said cells are autologous cells.
4. A method according to claim 1, wherein in step (a) the cells are applied at a rate of  $10^3$  to  $10^6$  cells per  $\text{cm}^2$ .
5. A method according to claim 1, wherein the culture medium used in step (b) is a conditioned liquid culture medium.
- 15 6. A method according to claim 5, wherein the culture medium used in step (b) is conditioned by prior exposure to viable marrow cells.
7. A method according to claim 1, wherein in step (b) the cells are contacted with the culture medium until a matrix layer of 1-100  $\mu\text{m}$ , in particular of 10-50  $\mu\text{m}$  has been produced.
- 20 8. A method according to claim 1, wherein in step (b) the cells are contacted with the culture medium for at least 2 weeks.
9. A method according to claim 1, for the provision of load-bearing implants, joint prostheses, maxillofacial implants or special surgery devices.

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